

## CLAIMS

What is:

1. A method of digital FM demodulator, comprising:
  - a) inputting a modulation signal to the delay lines with multiple output;
  - b) outputting a signal from the multiple output delay lines;
  - c) comparing the delayed signal phase with original modulation signal and
  - d) accumulating each compared phase difference;
  - e) the accumulated phase difference is quantized into one or more bit digital signal;
  - f) generating another set of digital signal based on the above accumulated digital signal;
  - g) outputting a signal from the multiple output delay lines according to the digital signal generated in step-e;
  - h) repeating the phase comparison and accumulation in step-c and quantization in step-e and re-select output signal from the multiple output delay lines in step-f, again the step-c,d,e,f;
  - i) After the cycle of step c-d-e-f, there is one set of digital signal pass to the output;
  - j) and filter out the quantized noise by way of a low-pass filter to obtain the original modulation signal.

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2. A of digital FM demodulator as claimed in claim 1, wherein said could convert into voltage or current waveform for and quantization.

3. A of digital FM demodulator, comprising:  
modulation signal by digital controlled delay lines;  
the delayed rising or falling edge of modulation signal with the modulation signal by phase detector to generate the phase-phase-lagging pulse signal;  
the phase difference of said two pulse into voltage level and capacitor, the voltage difference accumulated in capacitor is the phase difference accumulation;  
the capacitor voltage into one or more bit digital signal;  
accumulate the digital signal by digital integrator to generate a digital signal;  
the output signal of digital integrator into the digital controlled delay to control the delay time of delayed modulation signal;  
the output of step b,c,d,e to accumulate a digital signal will generate a digital signal which will filter out the high frequency noise by a low-pass filter to get original modulation signal.

4. A of digital FM demodulator, comprising:  
controlled delay lines used to delay input modulation signal;

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- b. ...tor to generate phase-leading or phase-lagging signal  
...rising or falling edge of delayed modulation signal  
...th original modulation signal;
- c. ...ore the accumulation voltage difference, said accumulated  
...o the accumulation of the phase difference;  
...e or more bit digital signal from capacitor voltage;  
...rator to accumulate the said above digital signal to generate  
...f digital signal;  
...l signal from said integrator to delay lines to control the  
...delayed modulation signal;  
...hich output signal been filter our by a low-pass filter to get  
...odulation signal.

5. ...f digital FM demodulator as claimed in claim 4, wherein said  
...l delay lines comprising delay units, multiplexer, and  
...output of delay unit is relative to each input of multiplexer and  
...f each delay unit is the same; the input digital signal after  
...select the corresponding output signal of multiplexer;  
...delay time of digital controlled delay lines is determined by  
...nal.

6. ...of digital FM demodulator as claimed in claim 4, wherein the  
...igital integrator need a trigger signal that could use input

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directly; said phase detector will compare the rising edge of  
signal and delayed modulation signal and using the falling  
quantizer and integrator.

7. A  
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digital FM demodulator as claimed in claim 4, wherein the  
be one or more bit analog-to-digital converter and one bit  
age comparator.

8. A  
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digital FM demodulator as claimed in claim 4, wherein the  
integrator use same bit number and one bit integrator is a

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